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B8H

(54) Lift car top barrier

(57) A lift car top barrier forms a collapsible safety barrier along at least one edge of a car top roof where a gap exists between the lift car and the lift shaft, in particular for the safety of the engineer carrying out maintenance on or from the lift top. A preferred barrier comprises one or more pivotable frames (22, 24) which can be raised to form the safety barrier and interlock by suitable means in the raised condition, and when unlocked can be pivoted down into a collapsed condition enabling the barrier to be accommodated within the lift car over-travel distance and avoid the need to dismantle and remove the barrier before returning the lift to normal working.

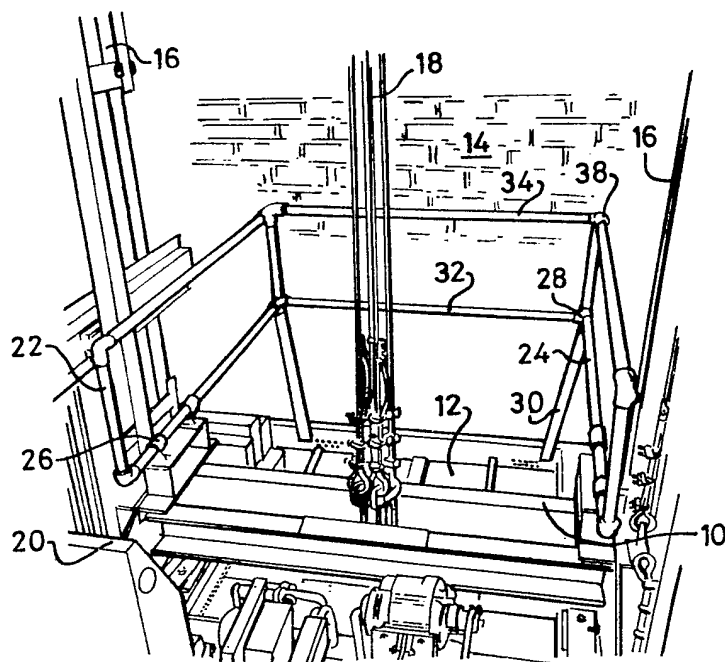
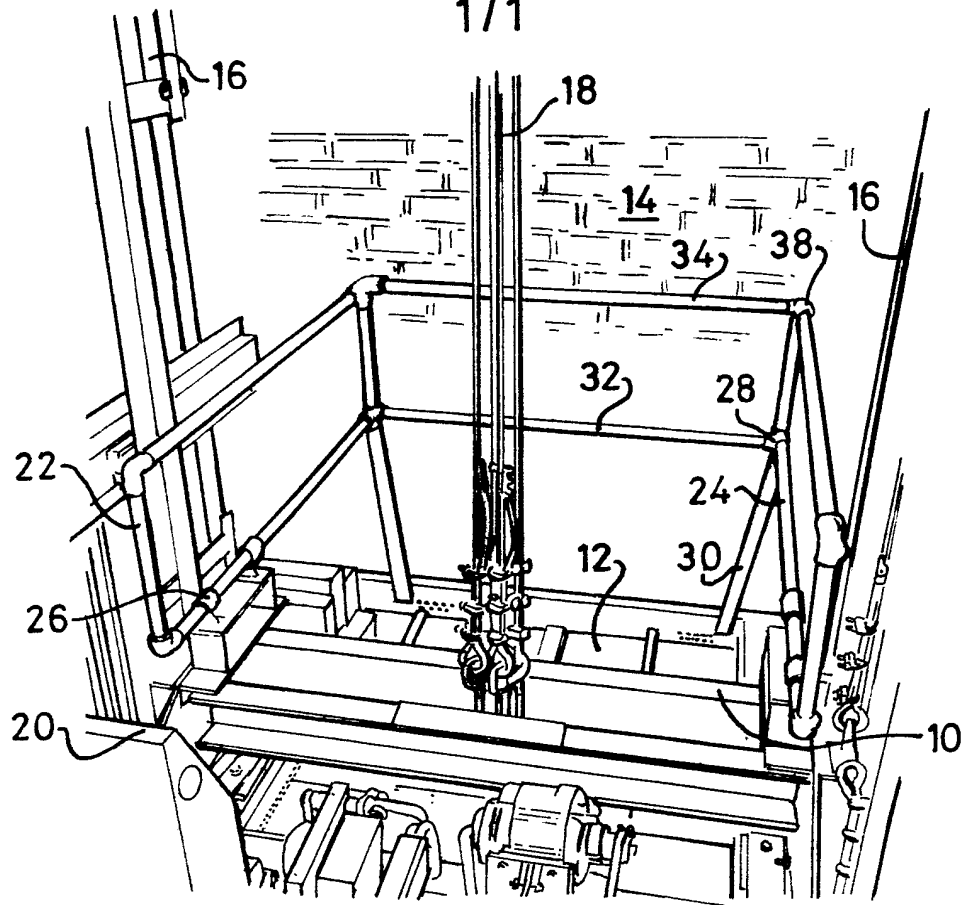
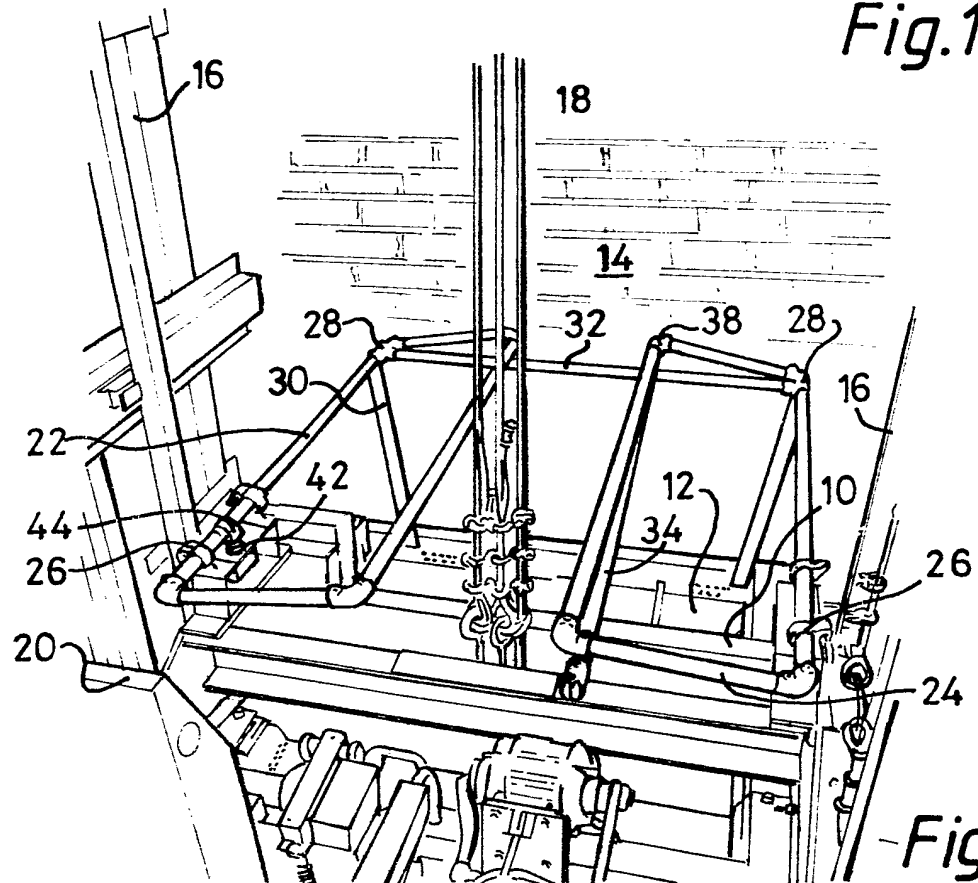


Fig.1

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*Fig. 1**Fig. 2*

SPECIFICATION

Lift car top barrier

5 This invention relates to a lift car top barrier, i.e. a barrier which fits on to the top of a lift car.

Lift inspection and maintenance often carries with it the requirement for a maintenance engineer to stand and move about on top of the roof of a lift car, sometimes while the car is moving up and down. A lift top control panel is commonly provided, with a normal mode/inspection mode switching facility, in order to ensure that the engineer has sole control of the lift whilst he is working from the lift top.

Frequently, on at least one to three sides, and sometimes even on the fourth side where the lift doors are situated, the lift car does not fit closely in the lift shaft. On the contrary, it is common for a substantial gap to exist wide enough to enable large items, or even the engineer himself, to slip into, and possibly fall to the bottom of the lift shaft.

In order to prevent such accidents, a temporary safety barrier could be erected and fixed on the car roof during inspection and maintenance, and dismantled and removed when work is finished. Removal of the barrier would commonly be a necessity, because in many lifts, when the lift car is in its uppermost position, the clearance below the ceiling of the lift shaft (referred to hereinafter as the overtravel distance) is relatively small and insufficient to accommodate a permanent lift top barrier. However, the erection and dismantling of a temporary barrier, each time maintenance or servicing is to be carried out using the roof of the lift car, would be both time-consuming and expensive.

According to the invention, there is provided a lift car top barrier which comprises a barrier means mounted on top of a lift car at or adjacent an edge of the roof, the barrier means being movable from a raised position in which it forms a safety barrier to a collapsed position which permits the normal upward travel of the lift towards the ceiling of the lift shaft without collision of said barrier means therewith.

In a preferred construction, two opposed parts of the barrier means which extend at or adjacent opposite side edges of the car roof are individually pivotable into raised positions, and a further part of the barrier means extending along another edge is movably carried by one of such first-mentioned parts and in the raised positions of said two first-mentioned parts can be interlocked with the other of said first-mentioned parts both to form a safety barrier at or adjacent said another edge and to lock the complete barrier means in its raised position.

Preferably, the barrier of the invention includes a switching means operable by movement of the barrier means for at least partly inhibiting the normal lift control circuitry when the barrier means is raised.

A practical embodiment of barrier in accordance with the invention will now be described with reference to the accompanying drawings, in which:-

Figure 1 is a view of a lift car top fitted with a barrier, with the latter in its raised position; and

Figure 2 is a similar view showing the barrier in its collapsed condition.

In *Figure 1*, the reference 10 denotes the cross head commonly provided at the centre line of the roof 12 of a lift car, i.e. side to side parallel to the lift car doors. The lift car moves in a lift shaft, of which the rear wall is designated 14. The lift guides on the left and right hand side walls of the lift shaft are referenced 16, whilst reference 18 denotes the suspension cables which pass into a machine room above the ceiling of the lift shaft. Certain control machinery and other control units can be seen beneath and in front of the cross head 10. In particular, the reference 20 denotes a lift car top control unit having a switch panel enabling an engineer working on the lift car roof to override the normal lift control circuitry so that he has sole control of lift car movement. Typically, the engineer working on the lift car top to carry out inspection and/or maintenance throws a normal mode/test mode switch into the test condition, and thereby has sole control of the lift car for inspection speed movement only.

The gap between the edges of the lift car roof and the lift shaft walls can be quite substantial at the rear and/or on either side, and/or occasionally at the front. This gap can be large enough for substantial objects to drop off the lift car roof and fall down the lift shaft. More important still, the engineer himself can be in danger due to the presence of this large gap. The invention provides a lift car top barrier, approximately 1.1 metres high measured from the lift car roof, as a safety means for preventing such accidents.

The barrier is made from 27 mm outside diameter galvanised tubing or solid section and corresponding fittings. At the left and right hand edges of the lift car roof, the barrier comprises generally rectangular frames 22, 24, each pivotally mounted adjacent its lower corners, at the front at 26 to the cross head 10 and at the rear at 28 to an upstanding support comprising legs 30 and crosspiece 32, the latter at a height generally corresponding to that of the top of the cross head.

As shown in *Figure 2*, each frame 22, 24 can pivot inwardly into a collapsed condition in which it occupies a minimum height above the level of the cross head 10. Collapsibility of the barrier is an essential requirement as the lift overtravel is generally insufficient to accommodate the barrier in its raised condition.

The barrier along the rear edge of the lift car roof is formed by a rail 34, pivotally connected, as at 38, to the upper rear corner of one of the frames 22, 24 and, in its operative position, connecting to the upper rear corner of the other of said frames 22, 24 by means of a locating and locking pin. Clearly, any other kind of interlocking means may be used instead of a locking pin. In its raised or operative position, the rail 34 not only forms a barrier at the rear edge of the lift car roof, but also serves to lock the entire barrier means, at the two sides and the rear, in its raised condition.

When unlocked, as shown in Figure 2, the rail 34 can pivot back to lie adjacent to the top rail of the frame 22 or 24 to which it is pivotted, and thence fold down with said frame into the collapsed condition.

As indicated in Figure 2, each pivotable frame 22, 24 has an associated plunger switch. The operable part 40 of this switch, with its plunger 42, is mounted on the lift car top, conveniently on the cross head, whilst a cam or lug 44 for driving the plunger is mounted on the bottom rail of the frame 22, 24. Both plunger switches are wired via a junction box in circuit with the lift car top control unit 20, so as to inhibit the normal mode lift car control circuitry while the barrier is in its raised condition. However, the engineer can still operate the lift by means of the test facility switch on the lift top switch panel.

The above-described barrier is given by way of example only and various modifications are possible within the scope of the appended claims. For example, sometimes a barrier may only be required at one or two edges of the lift car roof; conversely a barrier at all four sides may sometimes be desirable. According to the number of edges at which a barrier is required, differing means may be employed to interlock adjacent sides and thereby lock the entire barrier in its raised condition. As a simple example, two, three or four rectangular pivoting frames may be employed, with movable clips for interlocking adjacent frames at their upper corners juxtaposed in the raised condition.

As indicated in the drawings, the barrier top rails are preferably distinctively marked, as with chevron tape, to give them a prominent appearance.

The above-described and illustrated barrier is intended primarily to provide safety for the engineer, but if desired the barrier may have mesh or even solid walls to reduce risk that relatively smaller objects will be dropped down the lift shaft from the lift car roof.

CLAIMS

1. A lift car top barrier which comprises a barrier means mounted on top of a lift car at or adjacent an edge of the roof, the barrier means being moveable from a raised position in which it forms a safety barrier to a collapsed position which permits the normal upward travel of the lift towards the ceiling of the lift shaft without collision of said barrier means therewith.

2. A barrier according to claim 1, wherein said barrier means extends at or adjacent at least two edges of the roof.

3. A barrier according to claim 1 or claim 2, wherein said barrier means is lockable in its raised position.

4. A barrier according to claim 3 when appendant to claim 2, wherein said barrier means is lockable by interlock of the individual parts thereof which extend at or adjacent two adjacent edges.

5. A barrier according to any of claims 1 to 4, wherein the barrier means is pivotable between its raised and collapsed positions.

6. A barrier according to claim 2 or any claim appendant thereto, wherein two opposed parts of the barrier means which extend at or adjacent opposite side edges of the car roof are individually pivotable into raised positions, and a further part of the barrier means extending along another edge is movably carried by one of such first-mentioned parts and in the raised positions of said two first-mentioned parts can be interlocked with the other of said first-mentioned parts both to form a safety barrier at or adjacent said another edge and to lock the complete barrier means in its raised position.

7. A barrier according to any of claims 1 to 6, having a switching means operable by movement of the barrier means for at least partly inhibiting the normal lift control circuitry when the barrier means is raised.

8. A barrier according to claim 7, wherein the switching means comprises a plunger switch having a part fixed in relation to the lift car and a part carried by the barrier means.

9. A barrier according to claim 7 or claim 8, having a switching means associated with each raisable part of the barrier means.

10. A barrier according to any of claims 7 to 9, wherein the switching means is connected or has terminals connectible in circuit with the normal lift top control circuitry automatically to inhibit the normal lift control mode and either to permit inspection control or to permit manual switching into the inspection control mode.

11. A barrier according to any of claims 1 to 10, wherein the barrier means includes a top rail which is distinctively patterned.

12. A lift car top barrier substantially as hereinbefore described with reference to the accompanying drawings.

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ABSTRACT:

A lift car top barrier forms a collapsible

safety barrier along at least one edge of a car top roof where a gap exists between the lift car and the lift shaft, in particular for the safety of the engineer carrying out maintenance on or from the lift top. A preferred barrier comprises one or more pivotable frames (22, 24) which can be raised to form the safety barrier and interlock by suitable means in the raised condition, and when unlocked can be pivotted down into a collapsed condition enabling the barrier to be accommodated within the lift car over-travel distance and avoid the need to dismantle and remove the barrier before returning the lift to normal working. □